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10/589,602

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EXAMINER

HOLLWEG, THOMAS A

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,602	<b>Applicant(s)</b> KYUSHIMA ET AL.	
	<b>Examiner</b> Thomas A. Hollweg	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-11,13-15,17,19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-11,13-15,17,19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Acknowledgement of Amendment***

1. Applicant's Amendment, of September 2, 2009, is acknowledged. Claims 7, 12, 16, 18, 20 and 22 are canceled. No claims are added. Claims 1-6, 8-11, 13-15, 17, 19 and 21 are currently pending.
2. The amendments to at least claim 8 and to the specification are acknowledged. The objection to the drawings related to claim 8 are therefore withdrawn.
3. The amendments to the claims correcting minor informalities are acknowledged. The previous objections to the claims for minor informalities therefore withdrawn.

### ***Priority***

4. Receipt is acknowledged of foreign priority documents submitted under 35 U.S.C. 119(a)-(d). The certified Japanese language copy of JP 2004-040405 was received from the International Bureau on 6, 2006. The verified English Language translation was received on September 2, 2009.

### ***Claim Objections***

5. The following claims are objected to because of the following informalities:
  - a. The phrase "flat part in said glass substrate" of claims 1, 8 and 9 implies that elements are within the glass substrate. It is noted that this phrase was previously objected to in claim 3, and claim 3 was amended to read "flat part of said glass substrate."Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Then et al., U.S. Patent No. 5,568,013, in view of Syms, U.S. Patent No. 7,294,954 B2.**

8. **With regard to claim 1**, in figures 13-17, Then discloses a photomultiplier comprising: an enclosure (80) having an inside kept in a vacuum state, said enclosure whose at least part is constructed by a glass substrate (98) having a flat part; a photocathode (90), accommodated in said enclosure (80), emitting a photoelectron to the inside of said enclosure in response to light captured through said enclosure; an electron multiplier section (16), arranged on a predetermined area of the flat part in said glass substrate (98), for multiplying in a cascading manner the photoelectrons emitted from said photocathode; and an anode (104), arranged on an area excluding the area where said electron multiplier section (16) is arranged on the flat part in said glass substrate (98), for taking out electrons having arrived thereat among electrons multiplied in a cascading manner in said electron multiplier section (16) as a signal (col. 6, line 62 – col. 7, line 36).

9. Then does not expressly disclose that said anode is comprised of a silicon material.

Art Unit: 2879

10. Syms, in figure 4a, teaches a photomultiplier having an anode (405) where the anode is comprised of a silicon material (col. 3, line 22; col. 7, lines 9-28; 405 having same hatching as silicon members 401 and 407).

11. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Then photomultiplier where said anode is comprised of a silicon material, as taught by Syms, so that the anode can be constructed at the same time as the electron multiplier section.

12. **With regard to claim 2**, in figures 13-17, Then discloses that said enclosure (80) comprises a lower frame comprised of a glass substrate (98); an upper frame (86) opposing said lower frame; and a side wall frame (40), provided between said upper frame (98) and said lower frame (86), having a form surrounding said electron multiplier section (16) and said anode (104) (col. 6, line 62 – col. 7, line 36).

13. **With regard to claim 3**, in figures 13-17, Then discloses that said electron multiplier section (16) and said anode (104) are arranged on the flat part of said glass substrate (98) while in a state separated by a predetermined distance from said side wall frame (40) constituting a part of said enclosure (80) (col. 6, line 62 – col. 7, line 36).

14. **With regard to claim 4**, in figures 13-17, Then discloses that said side wall frame (40) is comprised of a silicon material (col. 3, lines 48-61).

15. **With regard to claim 5**, in figures 13-17, Then discloses that said upper frame (86) is comprised of a glass material (col. 7, lines 8-9).

16. **With regard to claim 6**, in figures 13-17, Then discloses that said electron multiplier section (16) is comprised of a silicon material (col. 3, lines 48-61).

Art Unit: 2879

17. **With regard to claim 8**, in figures 13-17, Then discloses that said electron multiplier section (16) is comprised of a silicon material (col. 3, lines 48-61), said electron multiplier section (16) and said anode (104) are in direct contact with and fixed to the flat part in said glass substrate (98) (col. 6, line 62 – col. 7, line 36).

18. **With regard to claim 9**, in figures 13-17, Then discloses that said electron multiplier section (16) and said sidewall frame (40) are comprised of a silicon material (col. 3, lines 48-61), said electron multiplier section (16), said anode (104) and said side wall frame (40) are in direct contact with and fixed to the flat part in said glass substrate (98) (col. 6, line 62 – col. 7, line 36).

19. **With regard to claim 10**, in figures 13-17, Then discloses that said upper frame (86) is comprised of a glass material (col. 7, lines 8-9); and wherein said upper frame (86) is in direct contact with and joined to said side wall frame (40) such that said upper frame (86) and said lower frame (98) sandwich said side wall frame (40) therebetween (col. 7, lines 25-33).

20. **With regard to claim 11**, in figures 13-17, Then discloses that said upper frame (86) has a transmitting window for taking light into said enclosure (80) (col. 7, lines 8-9).

**21. Claims 13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Then and Syms as applied to claims 1 and 2 above, in view of Burlefinger et al., U.S. Patent No. 6,492,657 B1.**

22. **With regard to claim 13**, in figures 13-17, Then discloses a method of manufacturing the photomultiplier according to claim 2, said method comprising the steps of: preparing said lower frame (98), comprised of a glass material, constituting a

Art Unit: 2879

part of said enclosure (80); preparing said side wall frame (40) constituting a part of said enclosure (80), said side wall frame being formed together with said electron multiplier section (16) by etching a single silicon substrate; preparing said upper frame (86) constituting a part of said enclosure (80); and fixing said side wall frame (40) to said lower frame (98) together with said electron multiplier section (16) and said anode (104) while making said side wall frame (40) be in direct contact with said lower frame (98) (col. 3, line 48 – col. 4, line 8; col. 6, line 62 - col. 7, line 36).

23. Then does not expressly disclose that the anode is formed together with the side wall frame and the electron multiplier section.

24. Burlefinger, in figure 1, teaches a photomultiplier having a side wall frame (21) being formed together with an electron multiplier section (24/26) and an anode (22) by etching a single silicon substrate (col. 2, line 42 – col. 3, line 43).

25. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the with the method disclosed by Then, where the anode is formed together with the side wall frame and the electron multiplier section, as taught by Burlefinger, because forming these elements together greatly simplifies that construction of the device.

26. **With regard to claim 15**, in figures 13-17, Then discloses a method where said upper frame (86) is comprised of a glass material; and wherein said upper frame (86) is in direct contact with and joined to said side wall frame (40) such that said upper frame and said lower frame (86) sandwich said side wall frame (40) therebetween (col. 6, line 62 - col. 7, line 36).

Art Unit: 2879

27. **With regard to claim 17**, in figures 13-17, Then discloses a method where said upper frame (86) is formed with a transmitting window for taking light into said enclosure (80) (col. 7, lines 8-9).

28. **Claims 14, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Then, in view of Burlefinger.**

29. **With regard to claim 14**, in figures 13-17, Then discloses a method of manufacturing a photomultiplier comprising an enclosure (80) constructed by a lower frame (98), a side wall frame (40), and an upper frame (86), while having an inside kept in a vacuum state, a photocathode (90) accommodated in said enclosure (80), an electron multiplier section (16) accommodated in said enclosure (80), and an anode (104) at least partly accommodated in said enclosure (80), said method comprising the steps of: preparing said lower frame (98), comprised of a glass material, constituting a part of said enclosure (80); preparing said side wall frame (40), comprised of a silicon material, constituting a part of said enclosure (80); preparing said upper frame (86) constituting a part of said enclosure (80); and fixing said side wall frame to said lower frame while making said side wall frame (40) be in direct contact with said lower frame (98) (col. 3, line 48 – col. 4, line 8; col. 6, line 62 - col. 7, line 36).

30. Then does not expressly disclose that the anode is comprised of a silicon material.

31. Burlefinger, in figure 1, teaches a photomultiplier (20) having an anode (22) comprised of a silicon material (col. 2, lines 42-52).



Art Unit: 2879

32. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Then photomultiplier device where the anode is comprised of a silicon material, so the anode can be formed from part of the silicone substrate (40), reducing cost and simplifying manufacture.

33. **With regard to claim 19**, in figures 13-17, Then discloses a method where said upper frame (86) is comprised of a glass material; and wherein said upper frame (86) is in direct contact with and joined to said side wall frame (40) such that said upper frame and said lower frame (86) sandwich said side wall frame (40) therebetween (col. 6, line 62 - col. 7, line 36).

34. **With regard to claim 21**, in figures 13-17, Then discloses a method where said upper frame (86) is formed with a transmitting window for taking light into said enclosure (80) (col. 7, lines 8-9).

### ***Response to Arguments***

35. The Applicant has submitted a verified English language translation of Applicant's foreign priority document JP 2004-040405, filed in Japan on February 17, 2004.

Applicant argues that the reference, Syms (U.S. 7,294,954), should not be considered as prior art in the present application under any section of 35 U.S.C. § 102, because the U.S. filing date of Syms is January 10, 2005.

36. The Applicant is entitled to the priority date of February 17, 2004, for any features of the present invention that were disclosed in JP 2004-040405 (see MPEP 201.15).

The English language translation of JP 2004-040405 has been closely considered.

However, the claim limitation of former claim 7, now incorporated into claim 1, that "said

Art Unit: 2879

anode is comprised of a silicon material" is not disclosed by JP 2004-040405. As a result, this feature will not be entitled to the priority date of February 17, 2004, but rather to the PCT filing date of February 16, 2005, where this feature was first disclosed.

37. It is noted that in the English language translation of JP 2004-040405 disclosed that substrates comprise a silicon material (claims 4 and 8, [0008, 0011, 0013, 0015, 0019, 0021, 0031 and 0036], etc.), that films (60 and 61) comprise a silicon material [0031] and that the electron multiplier section (31) comprises a silicon material. The anode is described in at least claims 1, 4, 6 and 8, as well as in paragraphs [0002, 0004, 0008, 0011, 0013, 0022, 0025, 0039, 0040 and 0046]. None of these descriptions include the feature that the anode is comprised of a silicon material. In contrast, the specification of the present application, filed August 16, 2006, specifically describes the anode as comprising a silicon material (page 3, lines 24-25; page 4, line 2).

### ***Conclusion***

38. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

39. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2879

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TH/

/NIMESHKUMAR D. PATEL/

Supervisory Patent Examiner, Art Unit 2879